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NiS Nanostructures for Application in Room Temperature Gas Sensors

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Abstract content
 (Max 300 words)

One dimensional (1D) nanosized materials (e.g. nanotubes, nanowires and nanorods) are being used extensively in high performance sensor devices owing to their high surface-to-volume ratio, highly crystalline nature and their semiconducting properties. Nickel sulphide (NiS) is an interesting material that has a semiconductor-metal transition (MIT) at approximately 260 K which is close to room temperature. A slight modification of this temperature by metal doping may push the transition temperature towards room temperature, which would make NiS a good candidate for room temperature gas sensing applications.

The high crystalline NiS nanostructures were synthesized via a microwave irradiated hydrothermal technique. Analysis of these structures was obtained via the use of electron microscopy, energy dispersive x-ray spectroscopy, x-ray diffraction spectroscopy and optical analysis techniques. The MIT of the as-synthesized NiS material was confirmed by electronic measurements and the effect of additional impurities on the NiS structure is also reported. The effect of temperature and gas concentration on the sensitivity of these nanostructures will also be discussed briefly.

Apply to be
 consider for a student
 award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
 PhD)?

PhD

Main supervisor (name and email)
and his / her institution

Dr Bonex Mwakikunga
CSIR

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

Yes

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